

AMENDMENTS TO THE CLAIMS

- A<sup>2</sup>.
1. (Original) A repeater for interfacing between a digital service network and a local network span comprising:
    - a first input port for connection to a first digital carrier link for coupling to a digital network;
    - a first output port for connection to a second digital carrier link for coupling to digital terminal equipment;
    - a first signal transmission path between the first input and output ports;
    - a second input port for connection to the second digital carrier link for coupling to digital terminal equipment;
    - a second output port for connection to the first digital carrier link for coupling to a digital network;
    - a second signal transmission path between the second input and output ports;
    - a first selectably-activated loopback circuit which, when activated, provides a third signal transmission path between the first input port and the second output port;
    - a second selectably-activated loopback circuit which, when activated, provides a fourth signal transmission path between the second input port and the first output port; and
    - a controller coupled with the first and second selectably-activated loopback circuits configured to selectively activate the first and second selectably-activated loopback circuits individually and simultaneously.
  2. (Original) The repeater of claim 1, wherein
    - a multi-position switch which activates the first signal regenerator when in a first position and de-activates the first signal regenerator when in a second position.
  3. (Original) The repeater of claim 2, further comprising:
    - a multi-position switch which activates the first signal regenerator when in a first position and de-activates the first signal regenerator when in a second position.

4. (Original) The repeater of claim 2, wherein  
the third transmission path further comprises the first signal regenerator when the first  
selectably-activated loopback circuit is activated; and  
the forth transmission path further comprises the second signal regenerator when the  
second selectably-activated loopback circuit is activated.
5. (Original) The repeater of claim 1, further comprising:  
a first visual indicator which signals when only the first selectably-activated loopback  
circuit is activated;  
a second visual indicator which signals when only the second selectable-activated  
loopback circuit is activated; and  
a third visual indicator which signals when the first and second selectably-activated  
loopback circuits are both activated.
6. (Original) The repeater of claim 1, further comprising:  
a multi-state indicator, with a plurality of visually distinct operating states configured to:  
operate in a first state when only the first selectably-activated loopback circuit is  
activated;  
operate in a second state when only the second selectably-activated loopback  
circuit is activated; and  
operate in a third state when the first and second selectably-activated loopback  
circuits are both activated.
7. (Original) The repeater of claim 1, wherein the first signal transmission path further  
comprises:  
a line build-out circuit.
8. (Original) The repeater of claim 1, wherein the second signal transmission path further  
comprises:  
a pre-equalizing line build-out circuit.

9. (Original) The repeater of claim 1, further comprising:  
a selectably-enabled power supply which, when enabled, provides power to the second digital carrier link for coupling to digital terminal equipment.
10. (Original) The repeater of claim 1, wherein the controller further comprises:  
a multi-position local switch wherein the switch:  
activates the second selectably-activated loopback circuit when in a first position;  
activates both the first and second selectably-activated loopback circuits when in a second position;  
de-activates the first and second selectably-activated loopback circuits when in a third position.
11. (Original) The repeater of claim 1, wherein the controller further comprises:  
a first loopback code detector configured to:  
if the first selectably-activated loopback circuit is de-activated, detect a loop-up code received at the first input port and then activate the first selectably-activated loopback circuit; and  
detect a loop-down code received at the first input port and then de-activate both the first selectably-activated loopback circuit, if in an active state, and the second selectably-activated loopback circuit, if in an active state; and  
a second loopback code detector configured to:  
if the second selectably-activated loopback circuit is de-activated, detect a loop-up code received at the second input port and then activate the second selectably-activated loopback circuit; and  
detect a loop-down code received at second input and then de-activate both the first selectably-activated loopback circuit, if in an active state, and the second selectably-activated loopback circuit, if in an active state.
12. (Original) The repeater of claim 1, further comprising:  
a first monitor jack for non-intrusively providing a monitor connection with the first signal transmission path; and

a second monitor jack for non-intrusively providing a monitor connection with the second signal transmission path.

13. (Original) The repeater of claim 12, further comprising:

a third jack for providing signal access to the first digital carrier link for coupling to a digital network; and

a fourth jack for providing signal access to the second digital carrier link for coupling to digital terminal equipment.

14. (Original) The repeater of claim 13, wherein signal access comprises signal detection and signal injection.

15. (Original) The repeater of claim 1, further comprising:

a first frame format detector configured to determine a first format of a first signal on the first signal transmission path;

a second frame format detector configured to determine a second format of a second signal on the second transmission path;

a first visual indicator which provides one of a first plurality of indications based on the first format; and

a second visual indicator which provides one of a second plurality of indicators based on the second format.

16. (Original) The repeater of claim 15 wherein the first and second formats of the first and second signals, respectively, are one of unframed, SF/D4, and T1-ESF.

17. (Original) The repeater of claim 1, wherein the first input port and the second output port are adapted for connection to a DSX-1 network.

18. (Original) The repeater of claim 1, wherein the second input port and the first output port are adapted for connection to a T1 span.

19. (Currently Amended) The repeater of claim 1, wherein the physical dimensions of the repeater conform to a ~~circuit-card specification~~ Network Communication Terminal Equipment (NCTE) Standard 200-type or 400-type circuit card for a standard wall-mountable telecommunications shelf.

20. (Cancelled)

21. (Currently Amended) The repeater of claim 19 wherein the ~~physical dimensions are less than substantially 13.5mm in length and less than substantially 14mm in height~~ circuit card includes a 56 pin pin-out.

22. (Original) A terminal extension repeater for interfacing between a digital service network and a local network span comprising:

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a first input port for connection with a terminal side of the digital service network, the first input port receiving a first digital signal;

a first output port for connection with a network side of the local network span connected with customer premises equipment, the first output port providing a first regenerated signal to the local network span;

a second input port for connection with the network side of the local network span connected with customer premises equipment, the second input port receiving a second digital signal;

a second output port for connection with the terminal side of the digital service network, the second output port providing a second regenerated signal to the digital service network;

a first signal regenerator coupled between the first input and output for generating the first regenerated signal based on the first digital signal

a second signal regenerator coupled between the second input and output for generating the second regenerated signal based on the second digital signal;

a first selectably-activated loopback circuit which, when activated, loops the first regenerated signal to the second output port;

a second selectably-activated loopback circuit which, when activated, loops the second regenerated signal to the first output port; and

a controller coupled with the first and second selectably-activated loopback circuits configured to selectively activate the first and second selectably-activated loopback circuits individually and simultaneously.

23. (Original) The terminal extension repeater of claim 22, wherein the controller further comprises:

a first loopback code detector configured to:

remotely activate the second selectably-activated loopback circuit when the second loopback code detector determines the second digital signal includes a loop-up code and the second selectably-activated loopback circuit is in a de-activated state;

remotely de-activate the second selectably-activated loopback circuit when the second loopback code detector determines the second digital signal includes a loop-down code and the second selectably-activated loopback circuit is in an activated state; and

remotely de-activate the first selectably-activated loopback circuit when the second loopback code detector determines the second digital signal includes a loop-down code and the first selectably-activated loopback circuit is in an activated state.

24. (Original) The terminal extension repeater of claim 23, wherein the first loopback detector is adapted to detect loop-up and loop-down codes in a plurality of formats.

25. (Original) The terminal extension repeater of claim 23, further comprising:

a second loopback code detector configured to:

remotely activate the first selectably-activated loopback circuit when the first loopback code detector determines the first digital signal includes a loop-up code and the first selectably-activated loopback circuit is in a de-activated state;

remotely de-activate the first selectably-activated loopback circuit when the first loopback code detector determines the first digital signal includes loop-down code and the first selectably-activated loopback circuit is in an activated state; and

remotely de-activate the second selectably-activated loopback circuit when the first loopback code detector determines the first digital signal includes a loop-down code and the second selectably-activated loopback circuit is in an activated state.

26. (Original) The terminal extension repeater of claim 25, wherein the second loopback detector is adapted to detect loop-up and loop-down codes in a plurality of formats.

27. (Original) The terminal extension repeater of claim 22, wherein the controller further comprises:

a multi-position local switch which, in a first position, simultaneously activates the first and second selectably-activated loopback circuits and, in a second position, de-activates all of the first and second selectably-activated loopback circuits which are activated.

28. (Original) The terminal extension repeater of claim 22, further comprising:

a line build-out circuit which adjustably attenuates the first regenerated signal before the first regenerated signal reaches the first output port; and

a pre-equalized circuit which adjustably re-shapes the second regenerated signal before the second regenerated signal reaches the second output port.

29. (Original) The terminal extension repeater of claim 22, further comprising:

a first monitor jack for non-intrusively providing a monitor connection with the first digital signal; and

a second monitor jack for non-intrusively providing a monitor connection with the second digital signal.

30. (Original) The terminal extension repeater of claim 22, further comprising:

a first frame format detector configured to determine a first format of the first signal;

a second frame format detector configured to determine a second format of the second signal;

a first visual indicator which provides one of a first plurality of indicators based on the first format; and

a second visual indicator which provides one of a second plurality of indicators based on the second format.

31. (Original) The terminal extension repeater of claim 30 wherein the first and second formats of the first and second signals, respectively, are one of unframed, SF/D4, and T1-ESF.

32. (Original) The terminal extension repeater of claim 22, wherein:  
the first input port and the second output port are adapted for connection to a DSX-1 network; and  
the second input port and the first output port are adapted for connection to a T1 span.

33. (Currently Amended) The terminal extension repeater of claim 22, wherein the physical dimensions of the terminal extension repeater conform to a ~~circuit-card specification~~ Network Communication Terminal Equipment (NCTE) Standard 200-type or 400-type circuit card for a standard wall-mountable telecommunications shelf.

34. (Cancelled).



35. (Currently Amended) The terminal extension repeater of claim 33 wherein the ~~physical dimensions are less than substantially 13.5mm in length and less than substantially 14mm in height~~ circuit card includes a 56 pin pin-out.

36. (Original) A repeater for interfacing between a digital service network and a local network span comprising:

a first input port for connection to a first digital carrier link to a digital network;

a first output port for connection to a second digital carrier link to digital terminal equipment;

a first signal transmission path between the first input and output ports comprising a first signal regenerator;

a second input port for connection to the second digital carrier link to digital terminal equipment;

a second input port for connection to the first digital carrier link to a digital network;

a second output port for connection to the first digital carrier link to a digital network;

a second signal transmission path between the second input and output ports comprising a second signal regenerator;

a first monitor jack for non-intrusively providing a monitor connection with the first signal transmission path; and

a second monitor jack for non-intrusively providing a monitor connection with the second signal transmission path.

37. (Original) The repeater of claim 36, further comprising:

a multi-position switch which activates the first signal regenerator when in a first position and de-activates the first signal regenerator when in a second position.

38. (Original) The repeater of claim 37, further comprising:

a first frame format detector configured to determine a first format of a first signal on the first signal transmission path;

a second frame format detector configured to determine a second format of a second signal on the second transmission path;

a first visual indicator which provides one of a first plurality of indications based on the first format; and

a second visual indicator which provides one of a second plurality of indications based on the second format.

39. (Original) The repeater of claim 38 wherein the first and second formats of the first and second signals, respectively, are one of unframed SF/D4, and T1-ESF.

40. (Currently Amended) The repeater of claim 36, wherein the physical dimensions of the repeater conform to a ~~circuit card specification~~ Network Communication Terminal Equipment (NCTE) Standard 200-type or 400-type circuit card for a standard wall-mountable telecommunications shelf.

41. (Cancelled).

42. (Currently Amended) The repeater of claim 40 wherein the ~~physical dimensions are less than substantially 13.5mm in length and less than substantially 14mm in height~~ circuit card includes a 56 pin pin-out.

43. (Original) A repeater for interfacing between a digital service network and a local network span comprising:

- a first input port for connection to a first digital carrier link to a digital network;
- a first output port for connection to a second digital carrier link to a digital terminal equipment;
- a first signal transmission path between the first input and output ports;
- a ~~X~~ second input port for connection to the second digital carrier link to digital terminal equipment;
- a second output port for connection to the first digital carrier link to a digital network;
- a second signal transmission path between the second input and output ports;
- a first monitor jack for non-intrusively providing a monitor connection with the first signal transmission path;

a second monitor jack for non-intrusively providing a monitor connection with the second signal transmission path;

a first frame format detector configured to determine a first format of a first signal on the first signal transmission path;

a second frame format detector configured to determine a second format of a second signal on the second transmission path;

a first visual indicator which provides one of a first plurality of indications based on the first format; and

a second visual indicator which provides one of a second plurality of indications based on the second format.

44. (Currently Amended) The repeater of claim 43, wherein the physical dimensions of the repeater conform to a ~~circuit card specification~~ Network Communication Terminal Equipment (NCTE) Standard 200-type or 400-type circuit card for a standard wall-mountable telecommunications shelf.

45. (Cancelled).

46. (Currently Amended) The repeater of claim 44 wherein the ~~physical dimensions are less than substantially 13.5mm in length and less than substantially 14mm in height~~ circuit card includes a 56 pin pin-out.

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